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ABSTRACT

This study examined whether the sources of information children use to substantiate story-based inferences are influenced by the medium of delivery. The 48 third grade students who acted as subjects were stratified by sex and randomly assigned to one of two media conditions; i.e., each child was presented an African folktale either (1) as a televised story, or (2) as a picture book narrated by an audiocassette. Following the presentation of the story, students were asked a series of inference questions and required to justify their answers. Each inference justification was classified as either visual, audio, audiovisual, or out-of-story based. Children who saw the televised story used visual and audiovisual information to justify their inferences more often than did the children who heard and saw the narrated storybook version. Conversely, children in the storybook condition based significantly more inferences on audio information. These results indicate that, when selecting media for presenting information to children, consideration should be given to the specific attributes of the media to which children attend. Suggestions for further research conclude the paper. A data table displays the results of the study, and a list of 11 references is included. (Author/MES)

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Effects of Media on Children's Inference Justifications

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Abstract

This study examined whether the sources of information children use to substantiate story-based inferences are influenced by the medium of delivery. Forty-eight third graders were stratified by sex and randomly assigned to one of two media conditions. Each child was presented an African folktale either as a televised story or as a storybook narrated by an audio cassette tape. Following presentation of the story, students were asked a series of inference questions and asked to justify their answers. Each inference justification was classified as either visual, audio, audio-visual, or outside-of-story based. Children who saw the televised story used visual and audio-visual information to justify their inferences more often than did the children who heard and saw the narrated, storybook version. Conversely, children in the storybook condition based significantly more inferences on audio information than did subjects viewing the televised story. These results indicate that when selecting media for use in presenting information to children, consideration should be given to the specific attributes of the media to which children attend.

Background

Children in our society are exposed to stories through a variety of media such as picture books, radio, audio cassette, film, and television. Numerous studies have been conducted to investigate the learning that occurs when children are presented stories via various media (Wetstone & Friedlander, 1974; Roberts & Bachen, 1981; Williams, 1981). The methodology and analyses employed in these and other studies allow only the investigation of overall effects produced by the different treatments -- i.e., with what medium does the most learning occur? Little attention is paid to the specific attributes of the media which might account for any differences.

Schramm (1979) has been critical of the approaches that characterize the so-called "intermedia" studies. He notes the lack of "studies intended to ascertain under what conditions and for what purposes one medium may be superior to another" (p.33). Recently, researchers have investigated the characteristics of different media which enhance specific types of learning in given contexts. Meringoff (1980), for instance, found that children's recall of story actions was

enhanced by a televised presentation of the story. Conversely, recall of story vocabulary was greater for children who had read a storybook version. These findings offer evidence that the differences in media presentations influence what content is learned. Television's animation may emphasize the visual content, while the still pictures in a storybook may allow greater attention to be paid to the narration.

In a related study Beagles-Roos & Gat (1983) examined the specific strengths of a televised presentation and a radio presentation of a story. Equivalent recall of story content was reported for both media. There were differences, however, in the types of information recalled. Children viewing the televised version recalled more details, while children in the radio condition recalled more expressive language. As in the Meringoff research, these differences are thought to be a result of specific attributes of the media. The pictures and animation provided visual enhancement leading to greater recall of details. Visuals were absent in the radio presentation, thus allowing more attention to be paid to the narration. This medium, therefore, resulted in greater recall of expressive language.

The Meringoff and Beagles-Roos and Gat studies indicate that children attend to different stimuli present in various media. For example, it seems plausible that children would focus on the video rather than the audio features of television. In support of this view, Ward and Wackman (1973) present a model of information processing for televised events; this model accounts for the age of the viewer. The model suggests that preschool children do attend primarily to visual presentations, often completely ignoring audio portions. As children mature, they begin taking into account both sources of information.

There appears to be support for the Ward and Wackman model in a number of settings involving children. For example, grade children have been shown to exhibit more accurate retention of the visual content rather than verbal content of movies (Hale, Miller, & Stevenson, 1968). More recently, researchers also found that children recalled more visual portions than auditory portions from television commercials (Zuckerman, Zeigler, and Stevenson, 1978). Children were also found to attend more frequently to visual elements

in televised cartoons (Hayes & Birnbaum, 1980). Each of these findings, however, is limited to the set of learner characteristics and type and length of events portrayed in the particualr study. Therefore, before it can be stated definitively that children attend differentially to visual and auditory segments of televised events, additional research is required with other age groups and different events.

The present study was designed to investigate whether stories presented in two different media affect the type of information used to justify story-based inferences. Some subjects saw the story on television while others saw the storybook version with accompanying audio-tape narration. Subjects were asked questions about the story for which they had to infer answers. Subjects were also asked to subtantiate their inferences. Inference justifications were categorized as being based on visual, audio, audio-visual, or outside of story information.

It was anticipated that subjects would respond differently to the inference justification questions based on the medium of presentation. Children who viewed the televised version were expected to focus their attention on story content primarily portrayed visually. Specifically, these children were expected to depend heavily on the animated actions of characters for justifying their story-related inferences. Children who heard the storybook version were expected to attend more to the verbally depicted events, and thus base more of their inference justifications on narrative passages and descriptions rather than on illustrations or animation. These finding would be in keeping with results of similiar studies (Meringoff, 1980; Beagles-Roos & Gat, 1983).

Method

Subjects

Subjects in this study were 46 third-grade children enrolled in the Developmental Research School, a laboratory operated by Florida State University in Tallahassee. The students in this school are selected to be representative of the school-age population of the State of Florida with respect to academic ability, sex, race, and socio-economic level. Twenty-two girls and 24 boys participated.

Materials

The materials selected for use in this study consisted of two versions of an African folktale, entitled A Story, A Story. One version of the story was a traditional 32-page picture book, illustrated with woodcuts. A second video version was an animated cartoon adopting the same graphic style as the storybook. Both versions used the same soundtrack narrated by a male speaking with an African accent. Thus, soft, African background music and the native accent of the narrator were consistent across both versions. The content of the soundtrack was nearly identical to the textual content of the storybook. Delivery of each version lasted approximately eight-and-one-half minutes.

A posttest consisting of five questions was designed to assess the children's ability to draw and substantiate inferences about characters' actions, feelings, and intentions. The oral posttest was administered to each child by an administrator immediately following the presentation.

Procedure

The children who participated in the study were stratified by sex and then randomly assigned to one of the two treatment groups and to a member of the research team. Members of one group were individually presented the videotaped version of the folktale and members of the other group saw and heard the storybook version. Because of scheduling constraints, a disproportionate number of subjects viewed the video presentation (n = 26) as opposed to experiencing the storybook condition (n = 20).

The story treatment was presented individually to each child a single time. The administrator listened to and/or watched the story along with each student. In the book condition, the administrator sat close to the child to enable the student to see each page while the narration was being delivered. The administrator turned the book's pages so that the text and illustrations were synchronized with the content of the soundtrack. In the video presentation, the child also sat close to the experimenter to watch the television monitor that stood equidistant in front of them at the child's eye level.

Immediately following the presentation, the administrator posed the five story-based inference questions and recorded the conversation on audio

cassette. Prior to asking the first question, the administrator encouraged the child to answer all of the questions. If the student did not respond to the question within a reasonable length of time, the administrator provided a nonspecific prompt (e.g., "Can you remember anything about that?") to elicit a response. If the subject still could not respond, the administrator asked the next question. Upon completion of the questioning, subjects were told not to discuss the story with their peers.

Measures

The responses of the children to the five inference questions were recorded, subsequently analyzed, and then classified into four categories established by the experimenters prior to the implementation of the treatment. These categories were as follows: 1) visual, 2) audio-visual, 3) audio, and 4) outside-of-story. Visual information was defined as information depicted solely in the visual portion of the presentation (e.g., the woodcut illustrations and animated woodcut illustrations). Audio-visual information referred to information portrayed in both the visuals and the narration, but not necessarily concurrently. Audio information was defined as information presented only in the story soundtrack. Finally, outside-of-story information was based upon general information not presented in the story.

The three experimenters collaborated in scoring the students' responses according to predetermined criteria.

The following examples serve to further clarify the categorizations of the justification statements made by the children. Responses coded as relying on visual content consisted primarily of action descriptions (e.g., the way the fairy was struggling). For justifications based upon auditory information, the child recalled the story dialogue (e.g., "she [the fairy] was furious." This information is stated by the narrator). Responses coded as relying on audio-visual content include "It took a long time for Ananse to tie up the leopard because he had to tie up all of his feet." (The illustration depicts all of the leopard's feet bound together and the narration states Ananse tied the leopard "by the foot, by the foot, by the foot, by the foot.") In responses determined as outside-story sources,

children drew upon their general knowledge (e.g., "leopards are heavy").

Results

The dependent variable -- i.e., the type of information children used to justify their inferences -- was measured by the number of justifications categorized as either audio, visual, audiovisual, or outside-of-story. Means and standard deviations associated for these categories were calculated for both the storybook and video treatments and are presented in Table 1.

The forty-six scores, categorized by basis of justification, were first examined visually. No extreme or aberrant scores were noted; the scores appeared to be consistent with the normality assumption. Hartley's Fmax test revealed that the variability of scores was similar for both conditions, thus, supporting the assumption of homogeneity of variance, F_{max} (2,20) = 2.25, $p > .05$.

Insert Table 1 about here.

Results were tested for statistical significance using two-tailed t-tests. An alpha level of .05 was set. A comparison of the mean scores in each category across the two treatment conditions revealed a significant difference between the means in three of the four categories.

The major hypotheses regarding the nature of subjects' inference justifications were supported. As anticipated, the number of story-based inferences relying on visual information were substantially greater for those children experiencing the video condition, $t(44) = 3.41$, $p < .001$. Video subjects also employed more audio-visual information to substantiate inferences than did storybook children, $t(44) = 2.18$, $p < .05$. Conversely, the number of inferences based on auditory information were significantly greater for the storybook condition, $t(44) = -2.45$, $p < .05$. In addition, children in the video condition utilized visual plus audio-visual information to a greater degree as a basis for their inferences, $t(44) = 4.13$, $p < .0001$.

An examination of the number of subjects who failed to respond to initial inference questions prompted additional analysis. Post hoc analysis revealed that storybook subjects generated fewer

initial inferences than did video subjects. This trend, however, did not reach significance, $t(44) = 1.71$, $p < .10$.

Discussion

The present study confirms previous research findings regarding the differential effects of video and storybook presentations on children's inference justifications (Meringoff, 1980; Beagles-Roos & Gat, 1983). Specifically, results provide added evidence that television conveys visual information more effectively than a storybook presentation. Further, a storybook presentation appears to promote greater attention to audio information such as story narration and dialogue. Apparently, since a video presentation inherently offers more salient and dynamic visual imagery than does a storybook presentation, the video medium promotes subjects' attention to visual information while simultaneously facilitating the encoding and learning of that information. On the other hand, in the storybook medium, visual information is inherently less salient than audio information. Thus, a storybook presentation promotes attention to audio information and facilitates the learning of that information.

An incidental finding of the present study was that video subjects based a significantly greater number of inferences on audio-visual information than did storybook subjects. This result suggests that audio-visual information is more effectively conveyed via video than via a storybook presentation. Also, subjects experiencing the video presentation may have attended to the story presentation more closely than storybook subjects. Since information categorized as audio-visual was presented in both narrative presentations, storybook subjects could have potentially based as many inferences on audio-visual information as did video subjects. Possibly, visual information is simply more easily encoded and learned by children than is audio, textual information. Since video subjects were exposed to more visual information than storybook subjects, and since visual information may be more readily learned by children than textual information, video subjects may have stored more audio-visual information than storybook subjects. It is difficult to draw more definitive conclusions regarding subjects' use of audio-visual information since, as Beagles-Roos &

Gat (1983) suggest, such information is presented both verbally and visually and there is no way to assess which channel a given subject employed.

Analysis of results also revealed a trend for video subjects to make a greater number of initial inferences than storybook subjects . This result is consistent with previous research findings which suggest that children apply more sophisticated inference strategies after viewing a video presentation than after experiencing non-video presentations (Schultz & Butkowsky, 1977; Beagles-Roos & Gat, 1983). The video medium and its dynamic representation of visual information may promote children's interest in narrative content and thus increase the extent to which children "think about" narrative elements. Another plausible explanation is that children possess stronger television viewing skills than the listening skills required to encode and store the information presented via a storybook presentation. Because of well developed television viewing skills, video subjects may have simply stored more story-related information, thus facilitating inference making.

One limitation on the generalizability of this study's findings has to do with the materials which were employed. Both the studies of Meringoff (1980) and Beagles-Roos & Gat (1983) utilized "A Story, A Story," which was also employed in the present study. Future researchers investigating the differential effects of media atributes on children's inference justifications should use narrative material other than "A Story, A Story." By utilizing different narrative material, researchers may be able to further verify and increase the generalizability of extant findings.

Evidence suggests that video effectively conveys visual information to children. Other studies might compare how video presentations and text with audio presentations differentially affect learning of expository, non-narrative material. For instance, many mathematical concepts may be depicted visually. Might learning materials in the video format produce greater learning of mathematical concepts than materials incorporating text and audio components? Also, is the storybook format a more effective medium for teaching language skills than the video format? How else might the salient visual imagery associated with video presentations be effectively

utilized to facilitate learning? What results would occur if secondary or college level students were used as experimental subjects to compare the effects of video and storybook narrative presentations?

Indeed, while many questions remain regarding the effects of various media attributes on learning, it seems clear that video-based narrative presentations effectively convey visual information while storybook presentations promote attention to textual, auditory information. Such specification of the effects of media attributes will hopefully contribute to the articulation of further research questions regarding the effects of various media attributes on learning.

Table 1

Mean Responses of Students by Source of Information for Justification of Inferences

Source of Inferences		Treatment: Television (n=26)	Treatment: Storybook (n=20)	t
Visual Information	Mean	1.27	.55	3.41*
	SD	.78	.61	
Auditory Information	Mean	.96	1.60	2.45**
	SD	.87	.88	
Audio-visual Information	Mean	1.46	.95	2.18**
	SD	.91	.61	
Outside-of-Story Information	Mean	.92	1.05	.49
	SD	1.02	.61	

* $p < .001$ (two-tailed test)

** $p < .05$ (two-tailed test)

References

Beagles-Roos, J., & Gat, I. (1983). Specific impact of radio and television on children's story comprehension. Journal of Educational Psychology, 75, 128-137.

Hale, G. A., Miller, L. K., & Stevenson, H. W. (1968). Incidental learning of film content. Child Development, 39, 69-77.

Hayes, D. S. & Birnbaum, D. W. (1980). Preschoolers' retention of televised events. Developmental Psychology, 16, 410-416.

Meringoff, L.K. (1980). Influence of the medium on children's story apprehension. Journal of Educational Psychology, 72, 240-249.

Roberts, D. F., & Bachen, C. (1981). Mass communication effects. Annual Review of Psychology, 305-356.

Schram, W. (1977). Big media, little media. Beverly Hills: Sage.

Schultz, T., & Butkowsky, I. (1977) Young children's use of the scheme for multiple sufficient causes in the attribution of real and hypothesized behavior. Child Development, 48, 464-469.

Ward, S. & Wackman, B. D. (1973). Children's information processing of television advertising. In P. Clark (ed.), New models for mass communication research, Beverly Hills: Sage.

Wetstone , H. & Friedlander, B. (1980). The effect of live, TV and audio story narration on primary grade children's listening comprehension. Journal of Educational Research, 68, 32-35.

Williams, B. T. (1981). How and what do children learn from television? Human Communication Research, 7, 180-182.

Zuckerman, M., Zeigler, M., & Stevenson, H. (1978). Children's viewing of television and recognition of commercials. Child Development, 49, 96-106.

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